

REMARKS

Entry of the foregoing amendment is respectfully requested. The Amendment is believed to place the application in condition for allowances and is, therefore, appropriate under Rule 116. The Amendment does not raise any new issues and, thus, does not require an additional search by the Examiner. The Amendment was not earlier presented because applicant became familiar with new grounds for rejection and an alleged indefiniteness of the claims only after they were first set forth in the final Office Action.

By the present amendment, several formal errors in the specification are corrected. Claims 116, 122, 127, 128, and 131 are canceled. Claim 139-143 are added. Claims 96, 98-115, 117, 123, 125, 126, 129, 132, 136, 137 are amended to eliminate the alleged indefiniteness therein.

Based on the foregoing amendments and the following remarks, the application is deemed to be in condition for allowance and action to that end is respectfully requested.

I. Objection to the Specification

The Examiner objected to the specification for formal errors therein. As noted above, the specification is amended to correct formal errors therein.

II. Rejection of Claims

IIa. Rejection under 35 U.S.C. § 112

The Examiner rejected claims 96, 98, 100, 101, 103-115, 126, 129, 132 and 136-137 under 35 U.S.C §112, second paragraph, for allegedly being indefinite. As noted above, claims 96, 98-115, 117, 123, 125, 126, 129, 132 and 137 are amended to eliminate an alleged indefiniteness therein. It is respectfully submitted that claims 96-115, 117-121, 123-125, 129-130, and 132-143 comply with all of the requirements of 35 U.S.C. §112.

It is further respectfully submitted that claims 96-101, 117-121, 123, 124, and 139-143 are in condition for allowance. Claims 139-143 correspond in scope to claims 116, 122, 127, 128, and 131, which the Examiner indicated would be allowable together with claims 96-101 and 117-124 if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, and to include all of the limitations of the base claim and any intervening claims.

Accordingly, claims 139-143, which are claims 116, 122, 127, 128, and 131 so rewritten, together with claims 117-124 dependant on claims 139, and claims 96-101 all of which are amended to eliminate an alleged indefiniteness therein, are in condition for allowance.

IIc. Rejection over the Prior Art

The Examiner rejected claims 102-115, 125-126, 129, 130, and 132-138 under 35 U.S.C §102(c) as being anticipated by Lintel, U.S. Patent No. 5,224,843 (Lintel). It is respectfully submitted that claims 102-115, 125, 126, 129, 130, and 132-138 are patentable over Lintel.

Specifically, claim 102 concerns a microproportioning system comprising a micro-diaphragm pump and an open-jet proportioner connected in series. In this system, the micro-diaphragm pump may pump liquid to the open-jet proportioner from the reservoir or from the outside. The open-jet proportioner may dispense the liquid, which was pumped in, in an open-jet. When the micro-diaphragm pump operates and the open-jet proportioner is at rest the system may allow liquid volume to flow from the proportioning port, which liquid can be proportioned on a substrate. In this mode of operation, the

liquid does not leave the proportioning port in an open jet. In a further mode, the micro-diaphragm pump drives an auxiliary liquid column (e.g. water) functioning as a pipette piston of an air cushion or air cushionless displacement system. (Please see page 7, lines 3-17, page 8, lines 1-2, and the description of the embodiment of Figure 1 in the substitute specification.)

Lintel (US 5 224 843) discloses a micro-proportioning system provided with a micro-diaphragm pump only. Liquid runs or drops out of outlet connector 5 especially if it is connected to an injection needle by tube 10 for administration of small quantities of medicaments (column 1, line 10 to 15). Moreover, Figure 13 and the related text in column 7, lines 16-66, indicate that the micro-pump provides a quasi-constant outlet flow generated by a multitude of pump strokes corresponding to membrane movements at 2 Hz and 5 Hz. In contrast, the open-jet proportioner of the inventive micro-proportioning system expels the liquid contained in the pressure chamber with one single pump stroke so that the liquid volume is catapulted out of the proportioning port in a drop or beam formation. Thus, Lintel neither discloses an open-jet proportioning system having a micro-diaphragm pump and an open-jet proportioner in series. The functions of the micro-diaphragm pump and the open-jet proportioner

within the inventive micro-proportioning system are also not disclosed by Lintel.

Accordingly, it is respectfully submitted that Lintel neither anticipates the inventive micro-proportioning system of claim 102 nor render its obvious. Therefore, it is respectfully submitted that claim 102 patentably defines over Lintel and is allowable.

Claims 103-115 and 130, 132-138 depend on claim 102 and are allowable as being dependent on an allowable subject matter.

In the micro-proportioning system according to claim 114 at least one of the micro-diaphragm pump, the open-jet proportioner, and the reservoir are combined to form one single constructional element.

The actuator module especially comprises driving means for the micro-diaphragm pump and/or the open-jet proportioner (page 12, first paragraph and page 42, first paragraph, concerning embodiment of Figures 11 and 12).

Actuator module 72 has, an associated with accommodation channel 73, actor

76, driving means, which bears with no gap against diaphragm of the proportioning chip 68.

As the actor, driving means, is part of the actuator module, and the constructional element comprising the micro-diaphragm pump and/or the open-jet proportioner is without actor, the exchangeable constructional element can be economically produced and can be used as a disposable unit. The disposable unit may simply be replaced after consumption of the liquid from the reservoir by another constructional element which can already be pre-charged with liquid. This greatly simplifies use of the micro-proportioning system in a laboratory.

The micro-pump disclosed by Lintel is connected to reservoir 7 by a tube 6. The micro-pump and reservoir are not combined to form one constructional element in one of a micro-system technology and hybrid technology.

Piezo-electric actor 13 of the Lintel-micro-pump is permanently bonded to the wafer 12 of the micro-pump using a suitable adhesive (column 3, lines 52 to 60). Actor 13 is not part of an actuator module to which the micro-pump is exchangeably connected. This makes the micro-pump expensive and unsuited

for a disposable of a micro-proportioning system for laboratory use.

Accordingly it is respectfully Lintel neither anticipates claim 114 nor renders it obvious, and claim 14 is patentable over Lintel. Claim 115 depends on claim 114 and is likewise patentable.

In the micro-proportioning system according to claim 125, the reservoir provides the liquid for an auxiliary liquid column. The auxiliary liquid column forms the piston which – like a pipette piston – draws in or expels liquid through the proportioning port. (Paragraph bridging pages 13-14 and the description of embodiments of figures 3 to 6.

Lintel discloses a micro-pump with a reservoir with liquid (especially a medicament) which is pumped by the micro-pump through the outlet so that the output thereof consists of the liquid from the reservoir. Lintel neither discloses a reservoir with an auxiliary liquid nor a proportioning control capable of a controlling displacement of the auxiliary liquid column so that it functions like a pipette piston. The function of an auxiliary liquid column is also not disclosed by Lintel.

In view of the above, it is respectfully submitted that Lintel does not anticipate or makes obvious the invention set forth in claim 125, and claim 125, together with claims 126, 129 dependent thereon, in patentable over Lintel.

CONCLUSION

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance, and allowance of the application is respectfully requested.

Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects, in order to place in case in condition for final allowance, then it is respectfully requested that such amendment or correction be carried out by Examiner's amendment and the case passed issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing this case

to allowance, the Examiner is invited to telephone the undersigned.

Respectfully Submitted

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